

Claims

- [c1] 1. A Method for sterilizing fluent material in large volume by radiation of ultraviolet rays, said method comprising the steps of:
- (a) guiding and/or forcing fluent material through filter(s) to remove large particles;
 - (b) using circuitous sterilizing chamber(s) with roundabout path(s), or spiral path(s), or sinuous path(s), or zigzag path(s), or other similar shapes of paths to contain said fluent material;
 - (c) employing intense UV irradiation to kill all live microorganisms in said fluent material passing through said chamber(s);
 - (d) converting ozone in air into oxygen when dealing with air;
 - (e) discharging sterilized fluent material out of said chamber(s).
- [c2] 2. Apparatus for sterilizing fluent material in large volume by radiation of ultraviolet rays, said apparatus comprising:
- (a) an inlet 1 guiding in fluent material for sterilizing;
 - (b) a power unit 2 positioned in said inlet 1;

- (c) an inlet filter 3 connected with said inlet 1 to remove fairly large particles from said fluent material;
- (d) a circuitous sterilizing chamber 10 connected with said inlet filter unit3;
- (e) a group of UV light tubes 15 positioned, along the flow direction, inside said chamber 10 providing high-density ultraviolet radiation to irradiate passing said fluent material;
- (f) connected with said chamber 10, an outlet filter unit13 to remove any particles larger than the requirements of application;
- (g) a catalytic filter comprised in said outlet filter unit3 to convert ozone into oxygen;
- (h) an inspection window or a sample faucet12 for taking testing samples;
- (i) an outlet11 extending from said outlet filter13 to discharge sterilized fluent material.

[c3] 3. The apparatus of claim 2 wherein said circuitous sterilizing chamber 10 may form roundabout path(s), or spiral path(s), or sinuous path(s), or zigzag path(s), or other similar shapes of paths for the purpose of increasing UV exposure.

[c4] 4. The apparatus of claim 2 wherein said chamber 10 is constructed with smooth curved flow guiding interior 7 at every turning section to form flow low flow resistant

chamber.

- [c5] 5. The apparatus of claim 2 wherein said chamber 10 has polished internal reflecting mirror surfaces 9 to increase UV killing effect.
- [c6] 6. The apparatus of claim 2 comprises UV visual inspection window(s) 5 in every section of said chamber 10.
- [c7] 7. The apparatus of claim 2 further comprises UV sensor(s) 6 in every section of said chamber 10 as auto-feedback mechanism.
- [c8] 8. The apparatus of claim 2 further comprises an inspection window or a sample faucet 12 on said outlet 11.
- [c9] 9. The apparatus of claim 2 wherein ozone generation is suppressed by use of non-ozone germicidal lamps.
- [c10] 10. The apparatus of claim 2 wherein an outlet filter unit 13 includes a catalytic filter to convert ozone into oxygen when dealing with air.